

REMARKS

Claim Rejections - 35 U.S.C. § 112

The Examiner has rejected claims 1-3 under 35 U.S.C. § 112 second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. Applicant has amended claims 1-3 to more particularly point and distinctly claim the subject matter which Application regards as the invention. As such, Applicant respectfully requests the removal of the 35 U.S.C. § 112 rejections of these claims.

Claim Rejections – 35 U.S.C. §§ 102/103

The Examiner has rejected claim 1 under 35 U.S.C. § 102(b) as being anticipated by Akimoto et al. (US 5,938,847). The Examiner has rejected claims 1- 2, 4 and 5 under 35 U.S.C. § 103(a) as being unpatentable over Blades (US Patent 3,291,347). The Examiner has rejected claims 3 and 7 under 35 U.S.C. § 103(a) as being unpatentable over Blades as applied to claims 1-2, 4 and 6 above, and further in view of Cazer et al. (US Patent 5,071,547). The Examiner has rejected claim 11-13 under 35 U.S.C. § 103(a) as being unpatentable over Toge (US Patent 5,134,445). It is Applicant's understanding that the cited references fail to teach or render obvious Applicant's invention as claimed in claim 1-4, 6-7 and 11-13.

Claims 1-3

With respect to claims 1-3, Applicant teaches and claims a method of generating a measured amount of chemicals which are used in a single wafer semiconductor cleaning process. According to the present invention, chemicals are fed into a valve system having a tube of a known volume. The chemicals are fed into the tube to fill the tube and obtain a measured amount of the chemical. The measured amount of chemical is then applied to a semiconductor wafer in a single wafer cleaning process.

Akimoto et al. fails to teach using a tube having a known volume to measure an amount of chemical. Applicant understands Akimoto et al. to measure the flow rate of a chemical to obtain the desired amount of chemical. Specifically, Akimoto et al. reads at Column 14, lines 5 "*Needless to say the pump provided on each resist-supplying pipe can supply resist liquid to the associated resist-applying nozzle in such a flow rate that the nozzle applies the liquid in the desired volume to the wafer W.*" As such, Akimoto clearly fails to teach utilizing a tube of a known volume to obtain precisely measured amount of chemical.

Blades describes an apparatus for dispensing a measured volume of fluid. Specifically, Blades describes a method of mixing blood with a saline solution. The blood/saline mixture is then analyzed. In Blades, the mixture is not applied to a semiconductor wafer nor is it used in a single wafer cleaning process. As such, it is Applicant's understanding that the cited references fail to teach or render obvious Applicant's invention as claimed in claims 1-3. Applicant, therefore, respectfully requests the removal of the 35 U.S.C. 102 and 103 rejections of claims 1-3 and seeks an early allowance of these claims.

Claims 4, 6 and 7

With respect to claims 4, 6 and 7, Applicant teaches and claims a method of mixing a precise amount of chemicals. According to Applicant's invention, a chemical is fed into a valve system having a tube of a known length to generate a known amount of the chemical. DI water is then fed into the valve system to push the measured amount of chemical into a chamber with the DI water. DI water is continually fed into the chamber until the mixture of the chemical and DI water reach a predetermined volume in the chamber. A sensor can be used to indicate when the predetermined volume is reached. Accordingly, Applicant teaches to measure one chemical with a tube of a known volume and then to measure the amount of the chemical/water mixture. Thus, in this embodiment of the present invention, the amount dilutant or DI water is not directly measured but is indirectly controlled by measuring the volume of the water/chemical mixture. In Blades, both the blood and dilutant are independently and directly measured. In Blades, the volume or amount of the mixture is not measured. In Blades, the blood (chemical) is measured utilizing the tube of a known volume and when precise dilutions are required, the dilutant is pre-measured to obtain the desired volume. Specifically, Blades states at Column 3, lines 37 "*The second fluid may be provide as a precisely measured volume in a separate container. Thus, precise dilution may be used using a novel apparatus.*" In Blades, both the blood (chemical) and dilutant are measured prior to mixing. As such, Blades fails to teach measuring one chemical and then measuring the amount of the chemical and dilutant mixture as claimed by Applicant.

As such, Blades clearly fails teach and render obvious Applicant's invention as claimed in claims 4, 6 and 7. Applicant, therefore, respectfully requests the

removal of the 35 U.S.C. § 103 rejections of claims 4, 6 and 7 and seeks an early allowance of these claims.

Claims 11-13

With respect to claims 11-13, Applicant teaches and claims a method of mixing chemicals which includes flowing a chemical into a first valve systems having a first tube of a known volume to generate a measured amount of the first chemical and then flowing DI water into a second valve system having a second tube of a known volume to generate a measured amount of DI water. An inert gas is then fed into the first and second valve systems to push the measured amount of chemical and a measured amount of DI water into a chamber where the measured amount of chemicals and the measured amount of DI water are mixed together to form a mixture of DI water and the chemical. As the Examiner correctly points out, Toge fails to disclose mixing chemical in his process. Additionally, Toge fails to describe utilizing two separate valve system having tubes of a known volume. As such, for the above mentioned reasons, it is Applicant's understanding that Toge fails to teach or render obvious Applicant's invention as claimed in claims 11-13. Applicant, therefore, respectfully requests the removal of the 35 U.S.C. § 103 rejections of claims 11-13 and seeks an early allowance of these claims.

New Claim 17

The Examiner objected to claim 5 as being dependent upon a rejected base claim, but indicated that it would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Applicant has rewritten claim 5 as new claim 17 wherein new claim 17 includes all of the limitations of claim 5 as well as all of the limitations of the base claim 4. As such, new claim 17 is allowable.

Pursuant to 37 C.F.R. 1.136(a)(3), applicant(s) hereby request and authorize the U.S. Patent and Trademark Office to (1) treat any concurrent or future reply that requires a petition for extension of time as incorporating a petition for extension of time for the appropriate length of time and (2) charge all required fees, including extension of time fees and fees under 37 C.F.R. 1.16 and 1.17, to Deposit Account No. 02-2666.

Respectfully submitted,

BLAKELY, SOKOLOFF, TAYLOR & ZAFMAN

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Michael A. Bernadicou
Reg. No. 35,934

Patent Counsel
Legal Affairs Dept.
APPLIED MATERIALS, INC.
P.O. Box 450A
Santa Clara, CA 95052

Telephone inquiries to:
Michael A. Bernadicou
(408) 720-8300